

Appl. No. : 09/945,051
Filed : August 31, 2001
Office Action Date : January 21, 2004
Response Date : April 21, 2004

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application. In the following listing Claims 1-4, 6, 10, 11 and 13 are canceled, Claims 5, 12 and 14 are currently amended, and Claims 7-9 and 15-18 remain as originally filed. Thus, Claims 5, 7-9, 12 and 14-18 are presented herein for further consideration.

Listing of Claims:

Claim 1 (Canceled)

Claim 2 (Canceled)

Claim 3 (Canceled)

32
Claim 4 (Canceled)

Claim 5 (Currently Amended): A base station transmitting data to and receiving data from an external mobile station at high speed, the base station comprising:

a base station communication controller for processing data including control data to output a predetermined data frame;

a base station ~~interfacier~~ interface for receiving a modulated uplink signal from the mobile station and transmitting a modulated downlink signal to the mobile station;

a mixer for mixing the modulated uplink signal with a predetermined intermediate frequency and filtering the mixed signal to convert the modulated uplink signal to a signal having the predetermined intermediate frequency;

an oscillator for generating the predetermined intermediate frequency;

a base station demodulator for demodulating the output signal of the mixer to generate a baseband signal according to a predetermined demodulation method;

Appl. No. : 09/945,051
Filed : August 31, 2001
Office Action Date : January 21, 2004
Response Date : April 21, 2004

a base station source decoder for receiving the baseband signal from the base station demodulator and performing source decoding according to a predetermined method;

a base station source coder for performing source coding of the data frame output from the base station communication controller; and

a base station modulator for modulating the output data of the base station source coder according to a predetermined method and outputting modulated data to the base station ~~interface~~ interface,

wherein the base station modulator outputs a modulated signal for a predetermined time and then outputs only a carrier having a predetermined frequency until a response is received from the mobile station.

B2
Claim 6 (Canceled)

Claim 7 (Original): The base station of claim 5, wherein the base station demodulator performs differential phase shift keying demodulation, and the base station modulator performs amplitude shift keying modulation.

Claim 8 (Original): The base station of claim 5, wherein the base station source decoder performs decoding according to a Manchester decoding method, and the base station source coder performs coding according to a Manchester coding method.

Claim 9 (Original): The base station of claim 5, wherein the base station demodulator comprises:

an amplitude limiting amplifier for receiving the output signal of the mixer and removing noise, thereby outputting a reliable signal;

a phase shifter for shifting the output signal of the amplitude limiting amplifier by a predetermined phase;

Appl. No. : 09/945,051
Filed : August 31, 2001
Office Action Date : January 21, 2004
Response Date : April 21, 2004

a quadrature detection receiver for receiving the output signal of the amplitude limiting amplifier and the output signal of the phase shifter, comparing the two signals to calculate the phase difference between them and filtering a signal corresponding to the calculated phase difference to output the variation of voltage; and

an amplitude comparator for comparing the output signal of the quadrature detection receiver with a predetermined reference value.

Claim 10 (Canceled)

Claim 11 (Canceled)

B2
Claim 12 (Currently Amended): A data communication method of a base station transmitting data to and receiving data from an external mobile station at high speed, the data communication method comprising the steps of:

receiving a modulated uplink signal transmitted from the mobile station to the base station, mixing the modulated uplink signal with a predetermined intermediate frequency and filtering the mixed signal to generate an intermediate signal having the predetermined intermediate frequency;

demodulating the intermediate signal according to a predetermined demodulation method to generate a baseband signal;

source-decoding the baseband signal according to a predetermined method to reconstruct original data received from the mobile station;

processing data including control data to form a data frame and source-coding the data frame; and

modulating the source coded data frame according to a predetermined method and transmitting the modulated signal to the mobile station,

Appl. No. : 09/945,051
Filed : August 31, 2001
Office Action Date : January 21, 2004
Response Date : April 21, 2004

wherein in the modulating step, the modulated signal is output for a predetermined time, and then only a carrier having a predetermined frequency is output until there is a response from the mobile station.

Claim 13 (Canceled)

Claim 14 (Currently Amended): An electronic toll collecting system for collecting a toll, the electronic toll collecting system comprising a mobile station and a base station, wherein a variety of data including a toll is transmitted and received between the mobile station and the base station at high speed, the mobile station comprising:

B2
a mobile station communication controller for processing control data and information including start place information and balance to form and output a mobile station information data frame, receiving base station information data including destination information and billing information from the base station, and recalculating and updating the balance;

a mobile station source coder for receiving the mobile station information data frame and performing source coding on it according to a predetermined coding method to output coded data;

a first modulator for receiving a first carrier having a predetermined frequency and modulating the coded signal from the mobile source coder using the first carrier to generate a first modulated signal;

a second modulator for receiving a second carrier having a predetermined frequency and performing modulation on the first modulated signal using the second carrier to generate a modulated uplink signal;

a mobile station ~~interfacer~~ interface for transmitting the modulated uplink signal to the base station and receiving a modulated downlink signal from the base station;

Appl. No. : 09/945,051
Filed : August 31, 2001
Office Action Date : January 21, 2004
Response Date : April 21, 2004

a first demodulator for receiving and demodulating the modulated downlink signal received from the base station via the mobile station ~~interfacer~~ interface and outputting demodulated data; and

a mobile station source decoder for performing source decoding on the demodulated data from the first demodulator to generate a baseband signal and transmitting the baseband signal to a base station communication controller,

the base station comprising:

a base station ~~interfacer~~ interface for receiving a modulated uplink signal from the mobile station and transmitting a modulated downlink signal to the mobile station;

a mixer for mixing the modulated uplink signal with a predetermined intermediate frequency and filtering the mixed signal to generate a signal having the predetermined intermediate frequency;

an oscillator for generating the predetermined intermediate frequency;

a base station demodulator for demodulating the output signal of the mixer to generate a baseband signal;

a base station source decoder for receiving the baseband signal from the base station demodulator and performing source decoding according to a predetermined method;

a base station communication controller for analyzing the mobile station's information data which is decoded and output by the base station source decoder to calculate a toll and processing data link layer control data and base station information data including destination information and billing data to form and output a predetermined base station information data frame;

a base station source coder for performing source coding of the base station information data frame; and

Appl. No. : 09/945,051
Filed : August 31, 2001
Office Action Date : January 21, 2004
Response Date : April 21, 2004

a base station modulator for modulating the output data of the base station source coder according to a predetermined method and outputting modulated data to the base station ~~interface~~ interface,

wherein the modulated downlink signal is output for a predetermined time, and then only a carrier having a predetermined frequency is output until there is a response from the mobile station.

Claim 15 (Original): The electronic toll collecting system of claim 14, wherein the mobile station source coder and the base station source coder perform coding according to a Manchester coding method, and the mobile station source decoder and the base station source decoder perform decoding according to a Manchester decoding method.

B Claim 16 (Original): The electronic toll collecting system of claim 14, wherein the second carrier is provided from the base station.

Claim 17 (Original): The electronic toll collecting system of claim 14, wherein the first modulator performs differential phase shift keying (DPSK) modulation, the base station demodulator performs DPSK demodulation, the second modulator and the base station modulator perform amplitude shift keying (ASK) modulation, and the first demodulator performs ASK demodulation.

Claim 18 (Original): The electronic toll collecting system of claim 14, wherein the base station demodulator comprises:

an amplitude limiting amplifier for receiving the output signal of the mixer and removing noise, thereby outputting a reliable signal;

a phase shifter for shifting the output signal of the amplitude limiting amplifier by a predetermined phase;

a quadrature detection receiver for receiving the output signal of the amplitude limiting amplifier and the output signal of the phase shifter, comparing the two signals to

Appl. No. : 09/945,051
Filed : August 31, 2001
Office Action Date : January 21, 2004
Response Date : April 21, 2004

calculate the phase difference between them and filtering a signal corresponding to the calculated phase difference to output the variation of voltage; and

an amplitude comparator for comparing the output signal of the quadrature detection receiver with a predetermined reference value.
